(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
21 November 2002 (21.11.2002)

PCT

(10) International Publication Number
WO 02/092183 A1

(51) International Patent Classification[7]: A63F 13/02

(21) International Application Number: PCT/IB02/01557

(22) International Filing Date: 29 April 2002 (29.04.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0111431.3 11 May 2001 (11.05.2001) GB

(71) Applicant: **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventors: **EVES, David, A.**; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). **COLE, Richard, S.**; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(74) Agent: **TURNER, Richard, C.**; Internationaal Octrooibureau B.V., Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

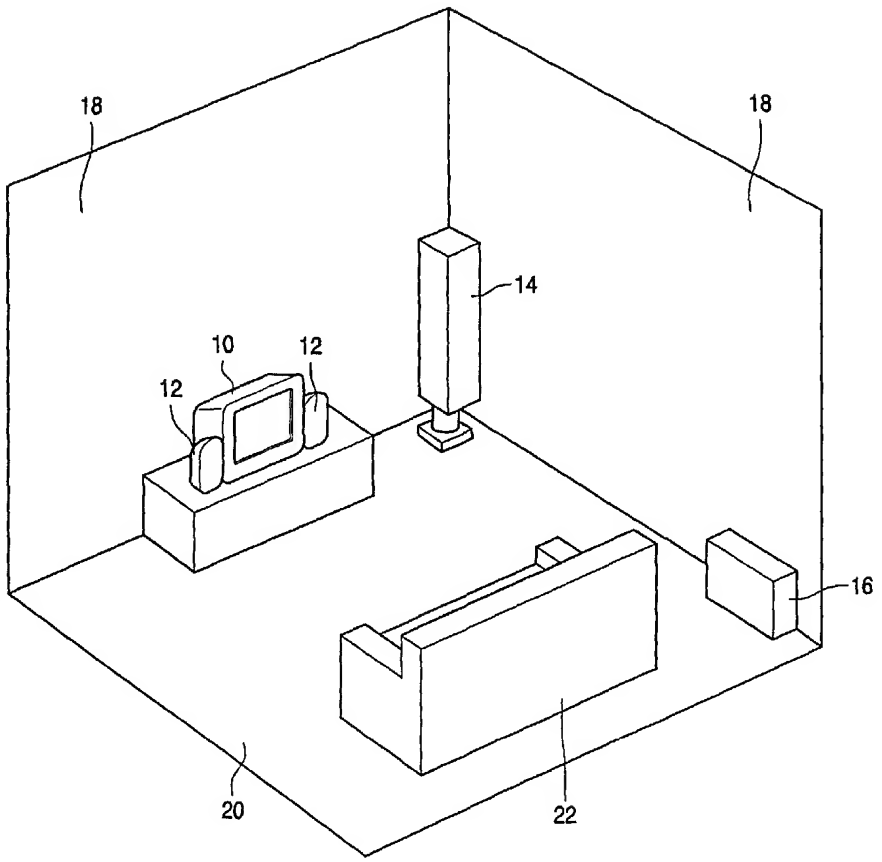
(81) Designated States *(national)*: CN, JP, KR.

(84) Designated States *(regional)*: European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A REAL-WORLD REPRESENTATION SYSTEM AND LANGUAGE



(57) Abstract: A real-world representation system comprises a set of devices, each device being arranged to provide one or more real-world parameters, for example audio and visual characteristics. At least one of the devices is arranged to receive a real-world description in the form of an instruction set of a markup language and the devices are operated according to the description. General terms expressed in the language are interpreted by either a local server or a distributed browser to operate the devices to render the real-world experience to the use

WO 02/092183 A1

DESCRIPTION

A REAL-WORLD REPRESENTATION SYSTEM AND LANGUAGE

This invention relates to a method of controlling a set of devices, a real-world representation system, a markup language enabled device and a markup language.

In order to make the Internet accessible to a larger number of people HTML (HyperText Markup Language) was developed along with browsers that could read HTML files. HTML is a language that principally describes documents and links between documents. The browser reads the HTML code and displays the document comprised of the text and links on a PC screen. In order to extend the rather limited text only nature of HTML, JAVA was developed. JAVA is a programming language and a JAVA program (or applet as it is commonly referred to) is compiled from source to object code and is then addressed by an HTML link to produce graphics etc. in the right place on the screen as desired. I.e. an HTML document can include within it a link to a compiled JAVA applet. In due course, to further extend the information that can be transferred by the Internet, VRML was developed. VRML originally stood for Virtual Reality Markup Language, but the M is now more often referred to as standing for Modelling. VRML is a way of describing a three-dimensional place or object in terms of its geometry that can then be represented on a screen that is user navigable.

However, none of these languages can even begin to describe a real-world experience nor render it for the end user.

According to a first aspect of the present invention, there is provided a method of operating a set of devices comprising receiving a real-world description in the form of an instruction set of a markup language and operating said devices according to said description.

The method advantageously further comprises distributing the description amongst the devices or reading the description at a local server.

The description may form part of a broadcast signal and/or it may relate to an activity that a user is undertaking.

According to a second aspect of the present invention, there is provided a real-world representation system comprising a set of devices, each device arranged to provide one or more real-world parameters, at least one of said devices arranged to receive a real-world description in the form of an instruction set of a markup language, and said devices being operated according to said description.

Owing to these two aspects of the invention, it is possible to provide and render a real-world experience.

Preferably the devices are interconnected by a wireless network or by a powerline carrier network.

According to a third aspect of the present invention, there is provided a markup language enabled device comprising receiving means for receiving a real-world description in the form of an instruction set of a markup language and adjusting means for adjusting one or more characteristics of the device according to said description.

Owing to this aspect of the invention, it is possible to provide a device that can be utilised in a system for providing a real-world experience.

Advantageously the receiving means of the device includes part of a distributed browser stored on a record carrier, the part interpreting the instruction set and communicating with the adjusting means. The browser can be arranged to interpret descriptions of a general type to generate specific parameter instructions for communicating to the adjusting means.

According to a fourth aspect of the present invention, there is provided a markup language for describing real-world experiences comprising an instruction set including instructions interpretable by a markup enabled device to operate said device.

Owing to this aspect of the invention, it possible to create instruction sets that correspond to real-world experiences, within the confines of a markup language, that can be used by enabled devices to render those experiences.

Such real-world experiences include visual, audio, olfactory and tactile sensations.

The markup language describes experiences in the physical world. It allows the authoring of spatial, temporal and structural elements but also more ambient qualities such as mood, sensory factors and the dynamics of the space.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a schematic perspective view of a real-world representation system,

Figure 2 is a perspective view of a markup language enabled device of the system of Figure 1,

Figure 3 is a flowchart of a method of controlling a set of devices, and

Figure 4 is a flowchart of an alternative method of controlling a set of devices.

In Figure 1 the real-world representation system comprises a set of devices including a display device 10, audio speakers 12, a lighting device 14, a heating device 16, walls 18 and the floor 20. These devices together contribute to make up the ambient environment, each device being arranged to provide one or more real-world parameters. For example, the lighting device 14 contributes colour tones as well as to the luminance level. The devices may be electronic or they may be purely mechanical. The devices are interconnected by either a wireless network or a wired network such as a powerline carrier network or a conventional cable system such as RS232 leads.

In addition to the display device 10, the walls 18 and floor 20 are provided with display functionality. This can be achieved either by the walls 18 and floor 20 being composed of fabric display material, or a centred ceiling projector can illuminate the visible portions of the walls 18 and the floor 20. It is also feasible to back light the walls 18 if the environment allows it.

The system of Figure 1 is shown as being a room with a couch 22 for a user, the room being part of a private dwelling. However the room could be, for

example, a hotel room or part of an entertainment complex or could form part of a public space.

At least one of the devices making up the real-world representation system is arranged to receive a real-world description in the form of an instruction set of a markup language, the devices being operated according to said description. This description could form part of a broadcast signal or it could be recalled from a local or remote store. The description could relate to an activity that a user is undertaking or could be triggered from a user interface or could trigger automatically from some predefined event, for example, a user entering a room.

In a first embodiment (outlined in the flowchart of Figure 3) this description is distributed amongst the devices. Each markup language enabled device operates in principally the same manner. For example, the lighting device 14 (shown in more detail in Figure 2) has receiving means 24 for receiving the real-world description in the form of an instruction set of a markup language, the receiving means 24 including part of a distributed browser that interprets the instructions of the instruction set. The portion of the browser in the receiving means 24 communicates with adjusting means 26 that is arranged to adjust one or more parameters of the lighting device 14. For example, if the real-world description reads <FOREST>, <SUMMER>, <EVENING> then the browser part in the receiving means 24 interprets this into specific instructions relating to the colour tones and luminance level for the adjusting means 26 to adjust their levels accordingly. In this example the likely colour tone would be a pleasant green and the light level would be low but warm. The browser part interprets instructions of a general type to generate specific parameter adjustments.

The description is received by all of the other parts of the distributed browser in each of the other devices in the real-world representation system. Each device interprets the instructions and adjusts its parameter configuration accordingly. The more enabled devices that are present in a particular environment the more realistic the end result will be. In particular the

operability of the walls 18 and floor 20 as display devices will determine how immersed in the real-world representation the user feels.

In a second embodiment (outlined in the flowchart of Figure 4) the description is read at a local server, which can be a dedicated device or could be contained within the capability of a device that nominally has a different purpose. In this embodiment a browser or operating system present on the local server interprets the instructions of the real-world description and generates specific parameter adjustments for communicating to the relevant device. In this way devices currently available can be used without the requirement that they be modified or purpose built for use in the real-world representation system.

In addition to the devices shown in Figure 1, a wide variety of additional devices are possible to augment the user's experience. These include such things as robotic devices such as robot lamps, interactive art such as pictures and sculpture, animatronic furniture and animatronic electronic equipment. All of these can add in to the experience according to their functionality.

The inclusion of the description in a broadcast signal allows the user to be immersed in an environment that is linked to a broadcast that he is receiving, for example a broadcast television signal. I.e. if the user is watching a film, then as the film moves through various scenes in turn these can be rendered by the set of devices making up the real-world representation system. If an underwater scene is showing on the television then the broadcast could include a description <WATER>, <COLD> and this will be interpreted by the relevant parts of the system to render the real-world experience to the user, turning the lights blue etc. The description need not be itself included in the broadcast signal, for example, a URL may be embedded in the signal and the description is communicated via a web link using the URL.

The description can be received at all locations where there is a real-world representation system operating and each individual system will render the experience to the best of the functionality of the devices in the system. For example, a cinema may be so designed that it can render experiences through

devices other than the conventional display screen and audio system. This will allow films that are augmented with descriptions to provide additional immersion into the film for viewers at the cinema.

The description can also relate directly to an activity that a user is undertaking, for example, reading a book. The individual pages of the book can trigger different descriptions being passed to the real-world representation system. Each description is linked by content to the particular theme or scene of the book at the respective point in the book. For example, the children's story "Little Red Riding Hood" has a number of discrete scenes within it, including a forest and the interior of a cottage, each of which can be rendered by the devices of the system in turn depending upon the place in the story that the reader has reached. A movement sensor may be employed to detect the turning of the pages, or the book may have inbuilt functionality that automatically detects which page the reader is looking at and triggers the appropriate description that is then rendered by the system. The triggering is ideally carried out via a wireless connection.

The description may also be delivered to a user in a manner other than via a broadcast signal. For example, the description may be triggered from a physical carrier such as a postcard which is augmented to include a description (or a URL pointing to a description) in the form of an instruction set of the markup language. This description could relate to the view depicted on the postcard. The description could be stored on the postcard in the form of a barcode, embedded RF tag or other similar technology. When the user receives the postcard their real-world representation system is transformed to reflect the scene or experience on the postcard. A tag reader coil can be placed around the letterbox, so that when the postcard arrives the system in the user's house reacts according to the description embedded in the postcard. The description on the postcard need not relate to the postcard, but could equally relate to the sender of the postcard.

Other methods of delivering the description to a user are possible. Local IR and RF systems can be utilised as carriers for descriptions. In the case of IR, this would be a standard or high end remote control that an

individual uses to control their consumer electronic devices around the home. The remote control is provided with, or has the ability to upload, descriptions or fragments of the markup language.

A user can therefore operate the system in a relatively simple manner from a user interface such as a remote control, although equally an enabled PDA or other mobile terminal could be employed. The user can select an environment that they wish to be immersed in from preselected total descriptions or create a new environment from pre- or userdefined variables. Such a total description may, for example, be <CHINESE RESTAURANT>, which real-world experience is then rendered by the devices in the system. The real-worlds generated can be fantasy environments or they can be realistic.

RF systems, such as Bluetooth are also suitable for transmitting and receiving descriptions. In this way descriptions can migrate by being stored on devices with Bluetooth capability. Such devices would be PDAs, mobile phones, lap top computers etc. As these devices are carried by users from environment to environment, there exists the ability to pass descriptions between the mobile device and a local storage medium. In this way new descriptions are received by environments.

The internet is also a route by which descriptions may be delivered to a user or directly to an environment. As the description is provided in a markup language format, descriptions and fragments of descriptions can easily be stored on servers for recall via a PC or suitably enabled digital TV. The descriptions can be updated and amended by the authors, thereby allowing a large and varied library of descriptions to be created, all of which can be easily accessed by a user.

A user can also generate instruction sets to augment experiences such as films. In effect the user authors descriptions that can be added to the original content. In this way their enjoyment of the film is increased. The user adds a data track to a recordable format disc, for example CD+RW or DVD+RW, via a PC to create a set of effects to go with the various scenes of the story. When the film is played back in an enabled environment, an

enhanced experience of the film is provided. In addition to authoring their own description, a user can recall descriptions from a library of instruction sets, which may be provided, for example, via the Internet.

The user can also operate the user interface to set limits on the operation of the devices in the system. For example, if the user wishes to set the volume of those devices with an audio capability to a specific range or set an upper limit on the volume then they can do so via the user interface. This prevents experiences becoming unpleasant for the user. The level of the light and the rate of any change in light intensity are also things that the user can control. All of the parameters of the system can be user defined.

In addition to the examples described above, which can be characterised as generally involving a "passive" user, interactive applications of the system are possible. An example of this is a game that a user may play, via a PC or games console for example. If the game is augmented with a description relating to the scenario and/or locations of the game world, then as the user navigates the game world the environment around them changes accordingly.

The description of the real-world experiences is provided by a markup language that communicates a description of physical environments and the objects within them, their relationship to the user, each other and to the physical space. Within a location that is enabled to produce a real-world experience, the instruction set of the markup language is interpreted by a device or devices to render the experience. Each device that is enabled contains a component that interprets the instruction set to the best of its capability.

The language contains a wide range of states that can be rendered by the devices in a real-world representation system. Such states relate to:-

- Image display – specific images, streamed video
- Audio – music, sound effects, voice
- Mood – emotional, ambient, animated
- Light – levels (relative/absolute), moods, colours, position, focus
- User display and input – feedback, menu display

- Time – time of day, season
- Location – absolute, fantasy, generic type.
- Smell – background, responsive
- Motion – robot devices
- Animatronic – movable furniture

The language has the ability to be extended to cover other states and forms of representation as desired.

Any information that relates to a physical experience can be expressed in this markup language. To create instruction sets in the markup language an author can write directly into the language or a computer program for authoring an instruction set can be used. The authoring program can take data input in the form of, for example, text or video and can generate a set of instructions comprising a subset of the markup language that when passed to a real-world representation system will allow the devices in that system to render the experience that corresponds to that of the text or video.

The language is XML compliant, XML being a meta-language that describes the standard structure for new markup languges.

CLAIMS

1. A method of operating a set of devices comprising receiving a real-world description in the form of an instruction set of a markup language and operating said devices according to said description.

2. A method according to claim 1, and further comprising distributing said description amongst said devices.

3. A method according to claim 1, and further comprising reading said description at a local server.

4. A method according to any preceding claim, wherein said description forms part of a broadcast signal.

5. A method according to any preceding claim, wherein said description relates to an activity that a user is undertaking.

6. A method according to any one of claims 1 to 4, wherein said description is triggered from a user interface.

7. A method according to claim 6, wherein said interface is a book.

8. A method according to claim 6 or 7, wherein said triggering is carried out via a wireless connection.

9. A method according to any one of claims 1 to 4, wherein said description is triggered from a physical carrier.

10. A real-world representation system comprising a set of devices, each device arranged to provide one or more real-world parameters, at least one of said devices arranged to receive a real-world description in the form of

an instruction set of a markup language, and said devices being operated according to said description.

11. A system according to claim 10, wherein said devices are interconnected by a wireless network.

12. A system according to claim 10, wherein said devices are interconnected by a powerline carrier network.

13. A system according to any one of claims 10 to 12, wherein a device of said set is a local server.

14. A system according to any one of claims 10 to 12, wherein said description is distributed amongst said devices.

15. A system according to any one of claims 10 to 12, wherein a device of said set comprises a user interface.

16. A markup language enabled device comprising receiving means for receiving a real-world description in the form of an instruction set of a markup language and adjusting means for adjusting one or more parameters of the device according to said description.

17. A device according to claim 16, wherein said device is an electronic device.

18. A device according to claim 16 or 17, wherein said device is a fabric device.

19. A device according to any one of claims 16 to 18, wherein said device is a display device.

20. A device according to any one of claims 16 to 19, wherein said device has audio capabilities.

21. A device according to claim 16 or 17, wherein said device is a lighting device.

22. A device according to claim 16 or 17, wherein said device is a heating device.

23. A device according to any one of claims 16 to 22, wherein said receiving means includes part of a distributed browser stored on a record carrier, said part interpreting said instruction set and communicating with said adjusting means.

24. A device according to claim 23, wherein said part of said browser is arranged to interpret instructions of a general type to generate specific parameter adjustments for communicating to said adjusting means.

25. A markup language for describing real-world experiences comprising an instruction set including instructions interpretable by a markup enabled device to operate said device.

26. A physical carrier having embedded therein executable instructions, said instructions forming part of the markup language of claim 25.

27. A computer-readable medium having executable instructions thereon, said instructions forming part of the markup language of claim 25.

28. A computer-readable medium according to claim 27, wherein said medium is of a recordable format.

29. An instruction set comprising an executable subset of the markup language of claim 25.

30. A computer program for authoring an instruction set of the markup language of claim 25.

31. A computer program for interpreting an instruction set of the markup language of claim 25 into a set of device operations.

32. A language according to claim 25, wherein said real-world experiences include visual, audio, olfactory and tactile sensations.

33. A language according to claim 25, wherein said language is XML compliant.

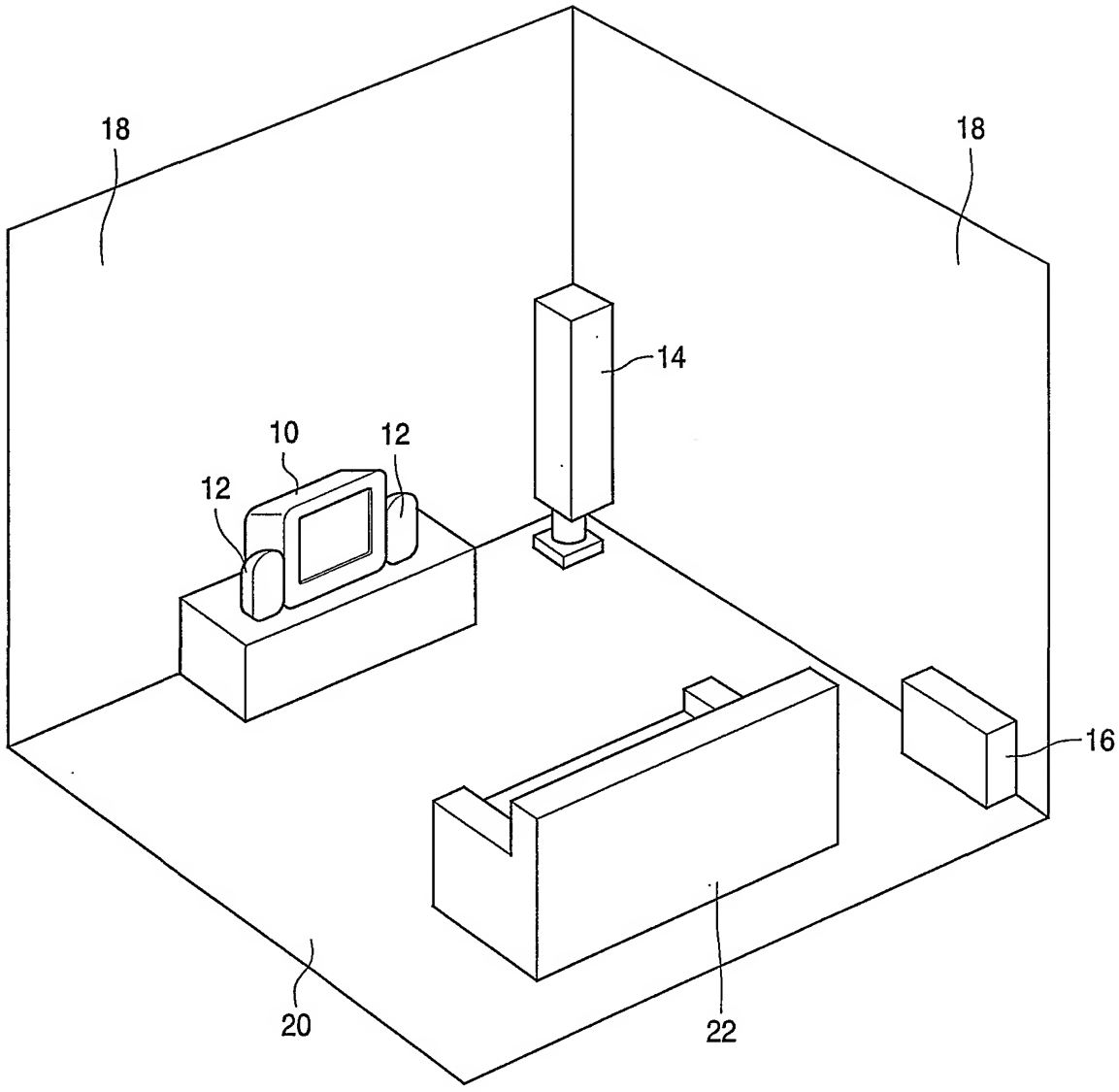


FIG. 1

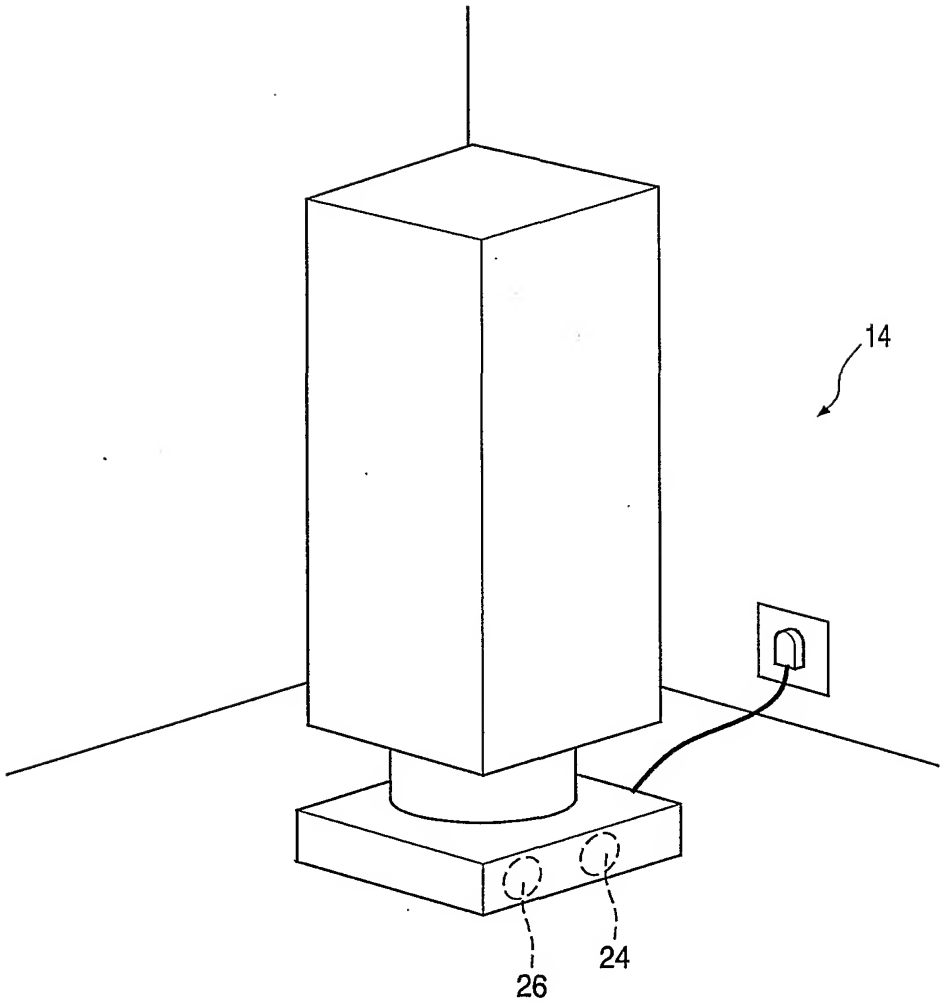


FIG. 2

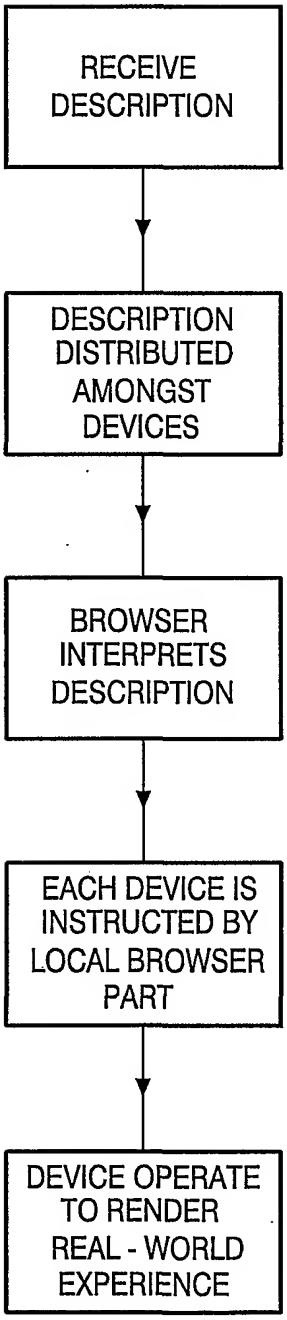

RECEIVE DESCRIPTION
DESCRIPTION DISTRIBUTED AMONGST DEVICES
BROWSER INTERPRETS DESCRIPTION
EACH DEVICE IS INSTRUCTED BY LOCAL BROWSER PART
DEVICE OPERATE TO RENDER REAL - WORLD EXPERIENCE

FIG. 3

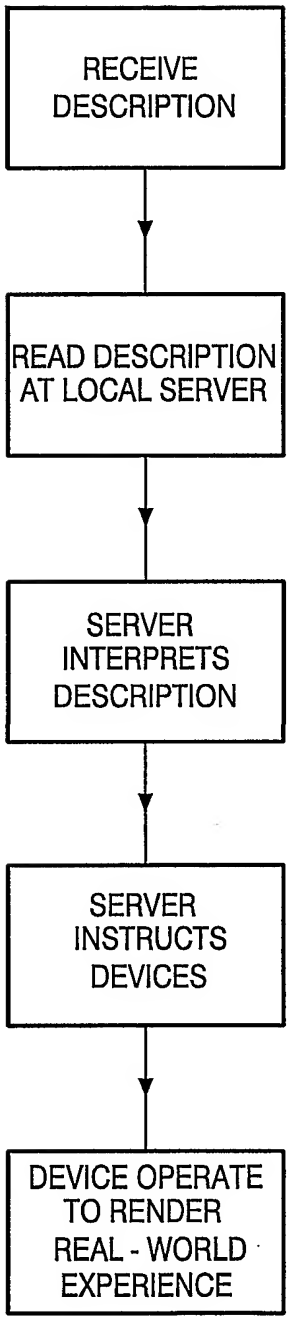

RECEIVE DESCRIPTION
READ DESCRIPTION AT LOCAL SERVER
SERVER INTERPRETS DESCRIPTION
SERVER INSTRUCTS DEVICES
DEVICE OPERATE TO RENDER REAL - WORLD EXPERIENCE

FIG. 4

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 02/01557

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A63F13/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A63F H04N G10H G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 59282 A (SAMSUNG INFORMATION SYSTEMS AM;SAMSUNG ELECTRONICS CO LTD) 30 December 1998 (1998-12-30) page 1, line 6,7 page 1, line 12 - line 16 page 3, line 6,7 page 3, line 18,19 page 3, line 27 -page 4, line 2 page 5, line 27 -page 6, line 6 page 9, line 10 - line 26 figure 3A	1,10,16, 25
Y	US 5 887 118 A (CRUICKSHANK RONALD DALE ET AL) 23 March 1999 (1999-03-23) column 6, line 3 - line 23 figures 2,5	1,10,16, 25

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 September 2002	02/10/2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Tito Martins, J

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 508 939 A (GOMES DOS SANTOS ALCINO) 14 October 1992 (1992-10-14) column 1, line 9 - line 16 column 2, line 10 - line 18	1,10,16, 25
A	DE 299 22 084 U (STROETMANN CHRISTIAN) 23 March 2000 (2000-03-23) page 2	1-33
A	HUANG CH-H ET AL: "THE DESIGN OF A LOW COST MOTION CHAIR FOR VIDEO GAMES AND MPEG VIDEO PLAYBACK" , INTERNATIONAL CONFERENCE ON CONSUMER ELECTRONICS. 1996 DIGEST OF TECHNICAL PAPERS. ICCE. ROSEMONT, JUNE 5 - 7, 1996, INTERNATIONAL CONFERENCE ON CONSUMER ELECTRONICS. ICCE, NEW YORK, IEEE, US, VOL. CONF. 15, PAGE(S) 380-381 XP000732987 ISBN: 0-7803-3030-7 page 380 -page 381 figures 1,2	1-33
A	US 6 161 126 A (MALLETT JEFFREY R ET AL) 12 December 2000 (2000-12-12) column 1, line 62 -column 3, line 11 column 1, line 54 - line 64 column 38, line 55 - line 65 figures 1,5	1-33
A	EP 0 848 553 A (NEXTLEVEL SYSTEMS INC) 17 June 1998 (1998-06-17) page 3, line 37 - line 51	1-33
A	US 5 398 070 A (LEE DONG H) 14 March 1995 (1995-03-14) column 1, line 7 - line 13 column 2, line 45 - line 64 figures 2,5	1-33

INTERNATIONAL SEARCH REPORT

Information on patent family members

Ir ational Application No
PCT/IB 02/01557

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 9859282	A	30-12-1998	CN	1269033 T	04-10-2000
			CN	1265753 T	06-09-2000
			CN	1267421 T	20-09-2000
			CN	1267422 T	20-09-2000
			EP	1015952 A2	05-07-2000
			EP	1015953 A2	05-07-2000
			EP	1002406 A1	24-05-2000
			EP	1015962 A2	05-07-2000
			EP	1002407 A1	24-05-2000
			WO	9859282 A2	30-12-1998
			WO	9859283 A2	30-12-1998
			WO	9859478 A1	30-12-1998
			WO	9859284 A2	30-12-1998
			WO	9859479 A1	30-12-1998
			JP	2002510415 T	02-04-2002
			JP	2002509628 T	26-03-2002
			JP	2000512472 T	19-09-2000
			JP	2002509669 T	26-03-2002
			JP	2000513916 T	17-10-2000
			US	6243707 B1	05-06-2001
			US	2001011284 A1	02-08-2001
			US	6198479 B1	06-03-2001
			US	6288716 B1	11-09-2001
			US	6182094 B1	30-01-2001
			US	2001038392 A1	08-11-2001
US 5887118	A	23-03-1999	NONE		
EP 0508939	A	14-10-1992	PT	97283 A	30-06-1992
			EP	0508939 A2	14-10-1992
DE 29922084	U	23-03-2000	DE	29922084 U1	23-03-2000
US 6161126	A	12-12-2000	US	6300936 B1	09-10-2001
			US	5956484 A	21-09-1999
			US	6219032 B1	17-04-2001
			US	6125385 A	26-09-2000
			US	6353850 B1	05-03-2002
			AU	1391199 A	07-06-1999
			EP	1036390 A1	20-09-2000
			GB	2348352 A ,B	27-09-2000
			US	2002095224 A1	18-07-2002
			WO	9926230 A1	27-05-1999
			US	6252583 B1	26-06-2001
			US	6343349 B1	29-01-2002
			US	6448977 B1	10-09-2002
			AU	735467 B2	12-07-2001
			AU	3889597 A	25-02-1998
			EP	0979444 A1	16-02-2000
			WO	9806024 A1	12-02-1998
			US	6101530 A	08-08-2000
			CA	2239125 A1	12-06-1997
			EP	0864144 A2	16-09-1998
			WO	9721160 A2	12-06-1997
			US	2002109668 A1	15-08-2002
			US	6366272 B1	02-04-2002
			US	6317116 B1	13-11-2001
			US	6028593 A	22-02-2000

INTERNATIONAL SEARCH REPORT

nformation on patent family members

Ir ational Application No
PCT/IB 02/01557

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6161126 A		US 2001002126 A1	31-05-2001
		US 6078308 A	20-06-2000
		US 2002021283 A1	21-02-2002
		US 2002050978 A1	02-05-2002
		AU 2579099 A	16-08-1999
		CA 2319586 A1	05-08-1999
		WO 9939273 A1	05-08-1999
EP 0848553 A	17-06-1998	US 6018764 A	25-01-2000
		CA 2223095 A1	10-06-1998
		CN 1195938 A	14-10-1998
		EP 0848553 A2	17-06-1998
		JP 10247945 A	14-09-1998
		TW 455788 B	21-09-2001
US 5398070 A	14-03-1995	KR 9604813 B1	13-04-1996